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THE EFFECTS OF LEADERSHIP STYLE AND SITUATIONAL
FAVORABILITY UPON THE PERCEPTION OF UNCERTAINTY AND RISK

Delbert M. Nebeker

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20. ABSTRACT (Continued)

reports the results of a study which examines the relationship between situational favorability and the perception of uncertainty and risk in an experimental setting, thereby providing a test of the validity of the relationship.

Seventy-one subjects were presented four paper and pencil simulations of leadership situations based on Fiedler's model. Estimates of perceived uncertainty and risk were derived from a number of scales presented to the subjects following each situation.

Analysis results indicated that uncertainty and risk was significantly related to situational favorability with favorable situations having certainty and little risk while unfavorable situations were uncertain and risky. Fiedler's scale of the leader's esteem for his least preferred co-worker (LPC) was not related to the major dependent variables.

These results support an interpretation of situational favorability as a dimension of perceived uncertainty, validating previous research and suggesting the possibility of integrating Fiedler's work with other contingency theories as well as decision research.

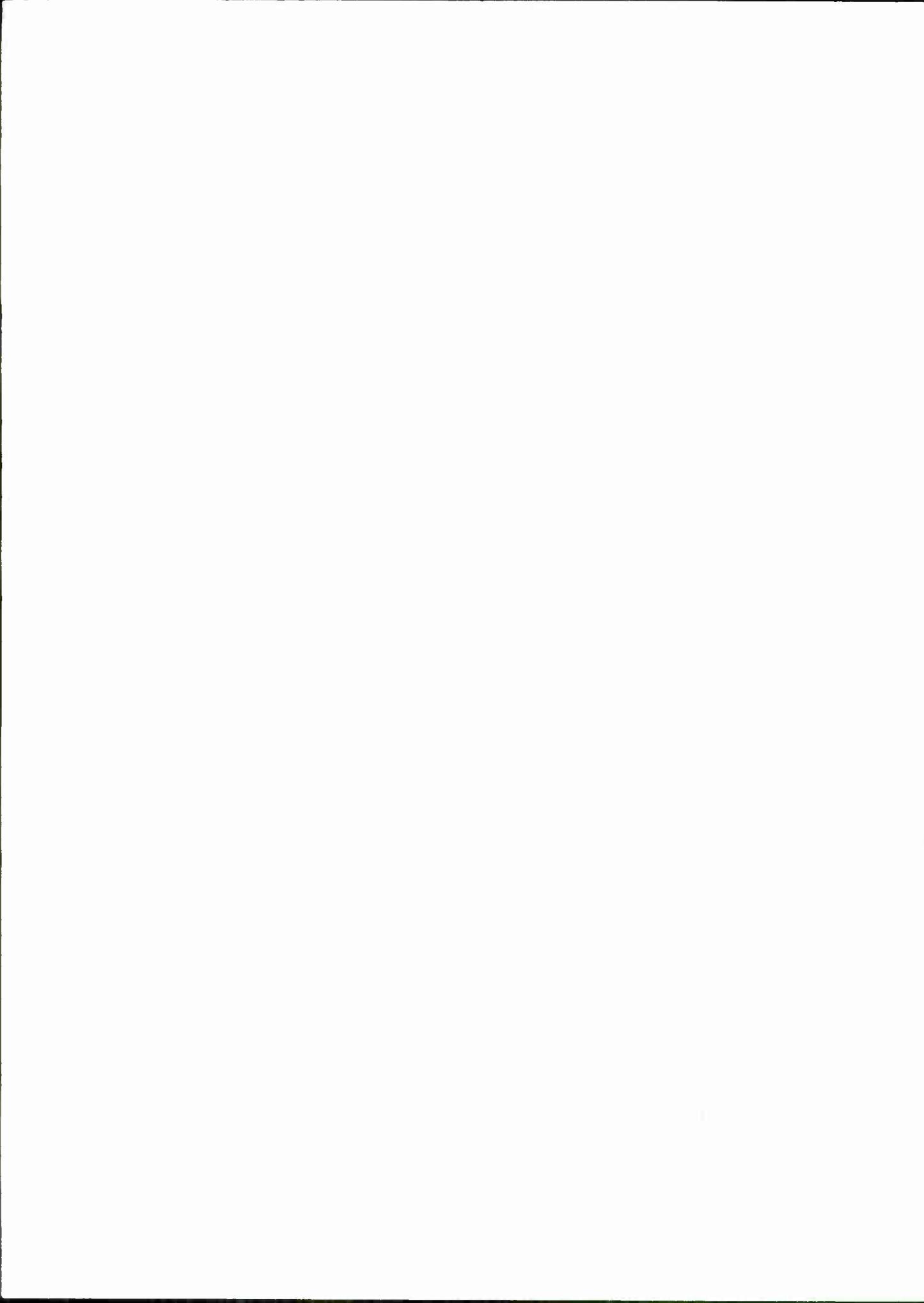


FOREWORD

This research was originally initiated under an Advanced Research Projects Agency contract NR177-473, N00014-67-4-0103-0013 (Fred E. Fiedler, Principal Investigator) and monitored by the Office of Naval Research. Study design and data collection were completed with that support. Final data analyses and report preparation were completed by the Navy Personnel Research and Development Center under Technical Development Plan: Man-power Management Effectiveness (Sub-project P43-07.04, Improved Manpower Utilization). The research was initiated to test whether or not the validity of previous findings (Nebeker, D.M., Situational favorability and perceived environmental uncertainty: An integrative approach, 1974) could be supported and extended in an experimental setting.

Sincere appreciation is expressed to all those individuals who played an important role in all stages of the research. Particularly Dr. Lee R. Beach and Mr. Stephen G. Green at the University of Washington and Dr. Richard C. Sorenson and Mr. Jeffery T. Haire at the Navy Personnel Research and Development Center.

F. L. Nelson
Commanding Officer



SUMMARY

Background and Problem

The importance of improving the effectiveness of Navy units is being addressed in Project P43-07X.04: Improved Manpower Utilization. A major factor influencing the effectiveness of any organization is the appropriateness of the unit's leadership style to its situation. The essence of this approach to leadership was developed by Fiedler (1967) in his contingency model of leadership effectiveness. The adequacy of Fiedler's approach depends upon the assessment of the leadership situation. Until recently, measurements of the situation have been interpreted as indicating the degree of control or influence available to the leader. However recent research has indicated that differences between the amount of uncertainty perceived in the situation reflects the important dimension. Since this recent work was based on field research it was determined to be necessary to validate the uncertainty interpretation of the situation in an experimental design.

Approach

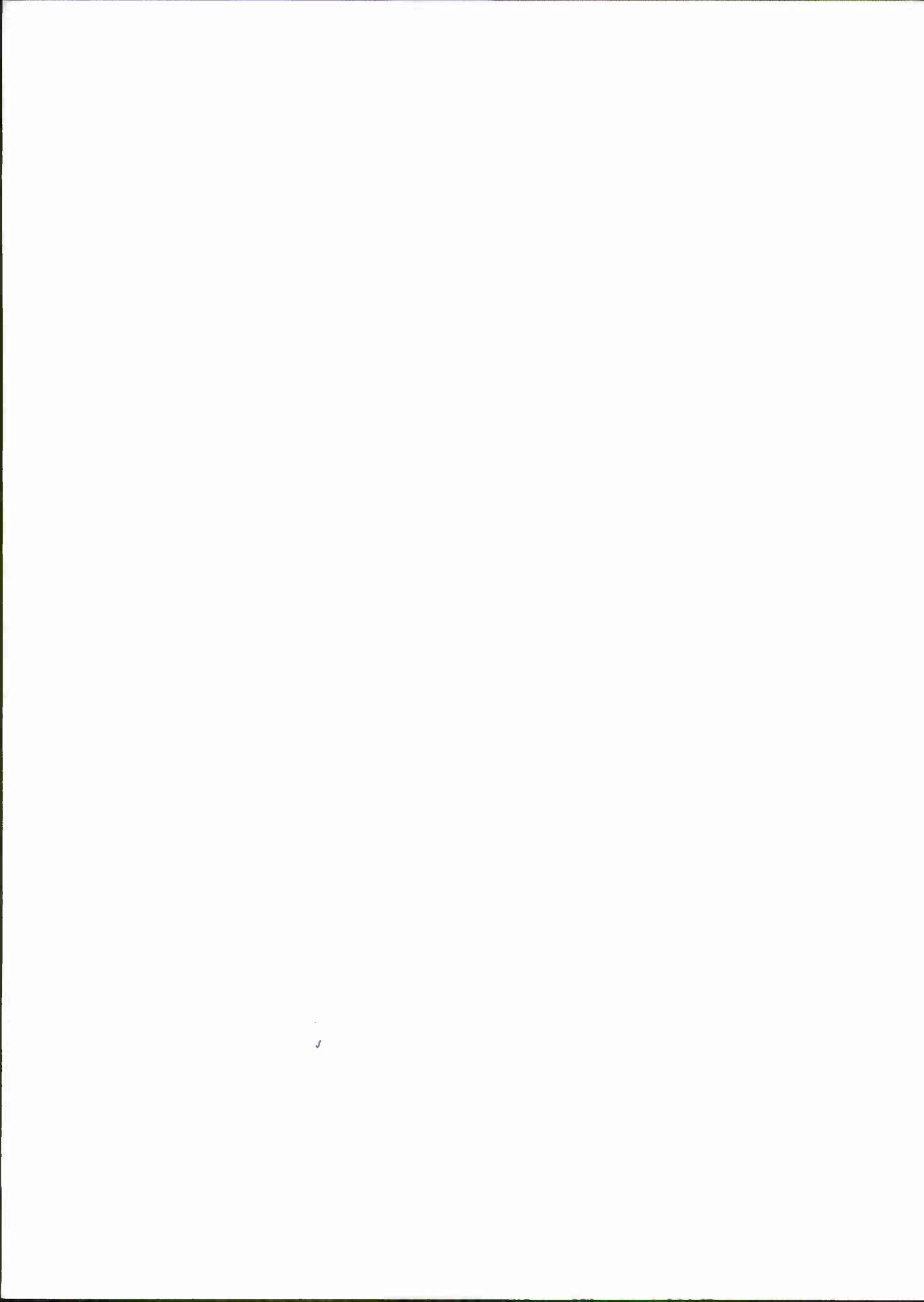
Seventy-one subjects were presented four simulated leadership situations. Based on their responses to these situations indexes of uncertainty and risk were created. These indices along with some additional measures were analyzed by means of a $2 \times 2 \times 4$ factorial design with repeated measures on the last factor. It was hypothesized that situations described by Fiedler as highly favorable would be characterized by certainty and little risk while situations described as unfavorable would be characterized by uncertainty and high risk.

Results

Analysis of the data indicate that the hypotheses were supported. A significant relationship was found between the situation and perceived uncertainty ($F = 66.002$, $df = 3/201$, $p < .001$) as well as the amount of risk ($F = 20.388$, $df = 3/201$, $p < .001$).

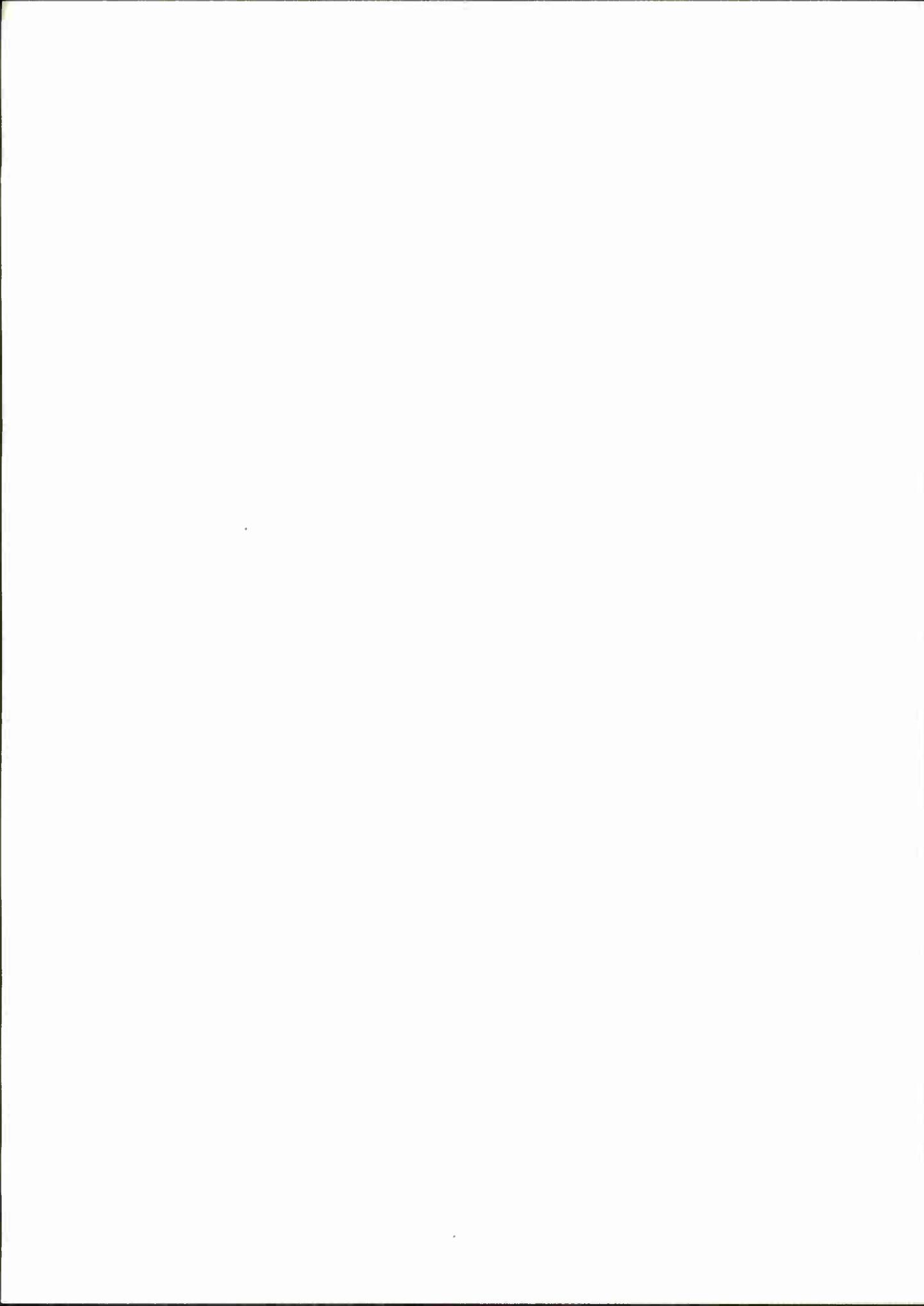
Recommendations

These results provide support for the interpretation of situational favorability as a perceived uncertainty dimension. Such an interpretation is the basis for recommendation that Navy-relevant techniques for assessing the uncertainty in Navy situations be developed in order to begin implementation of a contingency approach to leadership. Also the similarity between the interpretation of the situation in Fiedler's approach and current contingency approaches to organization design suggest that the principles of leadership and organization design are ready for integration. Therefore, research should be directed at developing a comprehensive contingency approach to organization and leadership in Navy situations.



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THE EFFECTS OF LEADERSHIP STYLE AND SITUATIONAL FAVORABILITY
UPON THE PERCEPTION OF UNCERTAINTY AND RISK

Introduction

In recent years the use of contingency approaches to leadership and organizational theory have become very prominent (e.g., Fiedler, 1967; Lawrence and Lorsch, 1969; Thompson, 1967; Woodward, 1965). In essence these approaches posit that there is no single best way to lead or organize but that the best way is contingent upon the situation or environment confronted. While each of these approaches predicts that the appropriateness of leadership style (or organization structure) is contingent upon the environment or situation, they use a variety of operations to define environments or situations. If these various theories are to ever be compared, or integrated, it is necessary to understand how their measured situation or environment characteristics relate. The purpose of the research reported here is to further the development of such an understanding.

One of the most influential of the contingency theories is Fiedler's theory of leadership effectiveness (Fiedler, 1967; 1971; 1972). However, critics of Fiedler's methodology and measurement have become increasingly vocal (Ashour, 1973; Graen, Orris & Alvares, 1971; Korman, 1973). Part of their concern stems from the changes in the number and kind of variables Fiedler has used to define what he calls situational favorability. As Korman (1973) points out, a prerequisite for any contingency theory to predict consistently is the establishment of norms for the parameters used to categorize the situations. If however, the primary underlying dimension in which situations differ could be identified, the measures of that dimension could be more easily compared to the situational variables of other contingency theories. At the same time identifying this underlying dimension would permit the use of a variety of measures without altering interpretation. Fiedler (1973) in an attempt to give situational favorability such a broad interpretation has labeled it a measure of the "control or influence" the leader has over his subordinates. Although this definition has intuitive appeal it remains mostly that, intuitive. Empirical support for such a definition has not been established (Nebeker, 1974).

Based upon some recent findings by Nebeker (1974) an alternative to Fiedler's control and influence interpretation of situational favorability is available and has been shown empirically to be superior to the control and influence explanation. This new interpretation characterizes situational favorability as a perceived uncertainty dimension. Specifically, highly favorable situations are characterized as having a high degree of perceived certainty while unfavorable situations are characterized by perceived uncertainty. Such an interpretation has a number of advantages. First, the use of uncertainty has theoretical appeal because it has been used in other contingency theories most notably Lawrence and Lorsch's (1969) and Thompson's (1967) organization theories.

The common reference to perceived uncertainty suggests the integration of a number of these theories. Secondly, uncertainty provides a rich conceptual base which suggests an articulation of leadership from a decision making perspective; something new and potentially useful (Vroom and Yetton, 1973). The third advantage is that it provides a parsimonious if not elegant description of the primary attributes of situational favorability.

In spite of the results which favor a perceived uncertainty interpretation of situational favorability, Nebeker's (1974) research was based on a field study and correlational results. Therefore, whether situational favorability causes uncertainty the reverse or some third factor causes the relationship remains to be determined. In addition if the uncertainty explanation of situational favorability is to be useful it must be shown that it is independent of Fiedler's measure of the leader's esteem for his least preferred co-worker (LPC); the other independent variable in his theory.

The research reported here was designed to test whether or not in an experimental setting situational favorability could account for differences in perceived uncertainty. The following specific hypotheses were tested: 1. Perceived uncertainty is negatively related to situational favorability. 2. Perceived risk is negatively related to situational favorability. In addition it was hypothesized also that the other independent variables (leader's identity and LPC) would not affect the above relationships.

Method

Research Strategy. The basic strategy for this research was to present subjects with a sample of simulated leadership situations representative of those described by Fiedler. The subjects responded to the situations by reporting their utility for both success and failure in each of the situations and their subjective probability that were they in the situation described they would be able to meet some specified new production requirements. This strategy was employed in order to provide control not available in most field settings while allowing subjects to respond to a variety of situations economically. Employment of such a strategy also meant that individual comparisons could be made capitalizing on the added control of a repeated measures design.

Subjects. Seventy-one male undergraduate students at the University of Washington participated as subjects in the study. The subjects were recruited from psychology classes and were paid for their participation.

Leadership Situations. Four simulated leadership situations were constructed using the following criteria:

1. The situations should be representative of the classification of situational favorability (Octants I - VIII) used in Fiedler's research. Therefore they needed to reflect a dicotomous classification of the important components of situational favorability most often identified by Fiedler (1967). These are: (a) How well the leader and his subordinates get along (leader-member relations); (b) How well defined and clear is the task and its method of accomplishment (task structure); (c) How much power is available to the leader over his subordinates (position power). It was also decided to select those situations which represent the octants which typically report the strongest predictions for performance and at the same time are the most different from each other.

2. The simulations should be simple and inexpensive with the principle manipulations embedded in a larger situational context.

3. The simulated situations should be such that no subject were he in that situation would anticipate either certain success or certain failure, i.e., there would be some uncertainty or risk involved.

On the basis of these requirements, four octants were chosen for simulation, they were: (a) Good leader-member relations; high task structure and high position power (OCTANT I); (b) Good leader-member relations, low task structure and low position power (OCTANT IV); (c) Poor leader-member relations; high task structure and high position power (OCTANT V); (d) Poor leader-member relations; low task structure and low position power (OCTANT VIII).

Four narrative descriptions of leadership situations were written which varied only the above characteristics. The descriptions for Octant I and Octant VIII are presented below. Octant IV and V were just the appropriate combinations of Octants I and VIII.

Octant I

"XYZ, Inc. is a small independent manufacturing firm that produces various electronic devices. The major part of XYZ's business consists of contracts from other, larger manufacturers who use XYZ components in their products.

You are the supervisor of a small assembly line operation where transistors are inserted into an electronic component as it passes on the line. The transistors are color coded to match each position in the component, thereby making the task very clear cut and minimizing confusion about how the work should be done. You have been in this position for the last five years and share a warm cooperative relationship with your subordinates; in fact, you often interact socially with them. The assembly line has performed adequately under your supervision. The workers respect you and are very supportive of your position as supervisor.

The area in which you work is a non-union shop and is, therefore, flexible in its pay scale, and in hiring and firing matters. Upper management is very supportive of your position and has granted you virtual independence in your hiring and disciplinary policies; any action which seems reasonable and effective is available to you.

Recently, in response to economic pressures, management has sharply increased the production standards for your assembly line. They have decided to allot three months for successful compliance with these new standards and at that time they will evaluate your performance."

Octant VIII

"ABC Company is a small advertising agency which is a branch of a larger parent agency. The major part of ABC's business derives from advertising contracts with local firms.

You are the General Manager of this small branch agency, having been in the position for only a few months. The job is a challenge in that creation of an advertising package for a client may be pursued in any number of ways; each contract presents a new situation which requires the creative contribution of each member of the agency. Your subordinates are still cold and distant and have yet to accept you. In fact, many of the older, more experienced workers resent you and doubt your competency as General Manager; you have had difficulty in gaining cooperation with many of your requests. In the past the productivity of this branch agency has been adequate.

A strong union operates within your agency and often complicates, if not confounds, your decisions. The management of the parent company has been intimidated by the union and is very non-supportive of your position as General Manager. Consequently, all hiring, firing and disciplinary matters are courses of action handled by upper management; you may only recommend.

Recently, in response to economic pressures, the parent agency has sharply increased the quota of client billings (dollars in contracts) for this branch agency. They have decided to allot three months for successful compliance with these new standards and at that time they will evaluate your performance."

To check that any results would not be limited to the method of self-descriptions and socially desirable responding an additional four

situation descriptions were written. These situations substituted an anonymously identified leader for the subject himself identified as the leader. Therefore, all references in the descriptions to "you" and "your" etc., were changed to Mr. X and his.

Procedure. The subjects reported to testing rooms by appointment in groups. After a brief introduction and explanation of what they would be asked to do the subjects each were given one of two test booklets (A or B).

Booklet A contained the four original situations. The situations were presented in counterbalanced orders to control serial order effects. Each situation description was followed by three rating scales. The first two were 11 point scales used to estimate the positive value of success and the negative value of failure. The subjects estimated how they would have felt if in the actual situation, they were and were not able to meet the new demands. The third scale was a 100 point probability scale used to estimate the subjects' subjective probability of success in the situation.

Booklet B contained the four modified situations in which an anonymous Mr. X was the leader. The same three scales as above followed each counterbalanced situation except that the subjects were asked to estimate how they thought Mr. X would have felt if able and not able to meet the demands.

Thirty-three subjects received Booklet A; 38 received Booklet B. Following the presentation of the situations and scales, a brief biographical questionnaire and Fiedler's 16 item LPC scale was given to each subject. After completing all their materials the subjects were debriefed, paid, and dismissed.

An Analysis of Variance (ANOVA) design was used to evaluate the hypotheses. A $2 \times 2 \times 4$ design with repeated measures on the last factor (Winer, 1962) was employed. The independent variables were: (a) the identity of the leader in the situation (the subject or an anonymous individual), (b) the subjects' LPC score (high or low), and (c) each of the four situations (octants I, IV, V, and VIII). The categorization of subjects as either high or low LPC was based on the established normative mean for LPC scores (Posthumus, 1970).

A variety of dependent measures could have been derived from the three scales which followed each situation. However, two dependent measures were selected for primary analysis because of their relevance to uncertainty and risk and appropriateness to ANOVAs. These measures were: a) the subjective probability of success (p) and b) expected loss consisting of the product of the probability of failure ($1-p$) and the negative utility of failure (U_f). Secondary analysis were performed on three other dependent measures as well. These were: (a) the positive

utility of success (U_s), (b) the negative utility of failure (U_f); and (c) the subjective expected utility of the situation (SEU). Where SEU is defined as:

$$SEU = PU_s + (1-P)U_f \quad (1)$$

Uncertainty is operationalized as the perceived probability of success (P); the smaller the P the greater the uncertainty. Risk is determined by the expected loss; the greater the expected loss the greater the risk.

Results

In most decision models the independence between P and U is an important assumption (Atkinson, 1964 is one exception). Therefore a test of this assumption was undertaken as a prerequisite to the ANOVA's on the dependent measures.

Pearson product moment correlations were computed between P and both the positive and negative utilities for each of the situations. These correlations generally support the independence of P, U_s and U_f . The average correlations between all the pairs of P's and U's was virtually zero ($r = .009$), while only 4 of the 32 r's were significant at the $p < .05$ level (not significantly different from a chance distribution). Inspection of these relationships for curvilinearity did not reveal any meaningful associations. The apparent independence of P and U make their separate and combined uses as dependent measure in the primary and secondary analyses more meaningful.

The first analysis performed was the analysis of variance of P. The summary of this ANOVA is presented in Table 1.

As can be seen neither the identity of the projected leader nor the LPC of the subject was related to P; suggesting that the impact of the situation was not influenced by the use of self reports or the leadership style (LPC). Also as can be seen in Table 1, the relationship between uncertainty (P) and the situation is highly significant. A plotting of the means for these situations is presented in Figure 1. Clear support for the hypothesis is found; as the situation decreases in favorability P also decreases. Therefore octant VIII has the greatest amount of uncertainty; octant I the least.

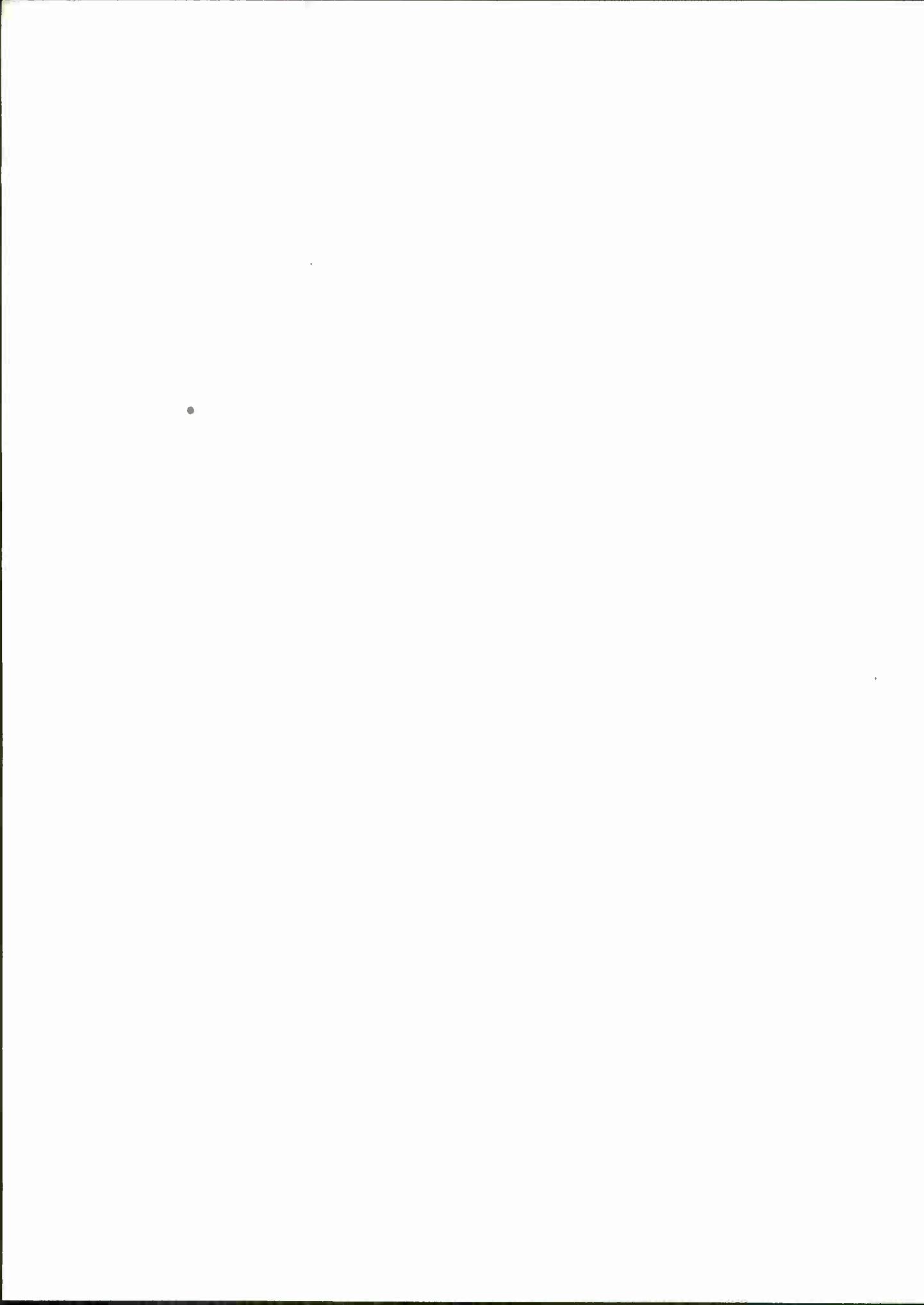
Finally, the summary table indicates that there were no interactions between any of the independent measures.

TABLE 1

Analysis of Variance of
Subjective Probability of Success

SOURCE	df	MS	F
Between Subjects			
Identity of Leader (A)	1	.1031	1.282
LPC (B)	1	.0720	.896
AXB	1	.0785	.976
Error Between	67	.0803	
Within Subjects			
Situation (C)	3	1.091	66.002 *
BXC	3	.0077	.468
CXA	3	.0022	.135
AXBXC	3	.0138	.833
Error Within	201	.0165	

* $p < .001$



The second ANOVA, analyzed the perception of risk as measured by the expected loss. These results are presented in Table 2. Once again the leader's projected identity and the subject's LPC were not significantly related to the dependent measure and no interactions were found; whereas the situation was highly related to expected loss. Figure 2 presents the plotting of the means from this analysis. As can be seen the hypothesis is again supported; as the favorability of the situation decreases the expected loss or risk increases.

Additional ANOVAS were computed on the remaining dependent measures with very similar results. SEU was found to be significantly related to the situations ($F = 56.87$; $df = 3/201$; $p < .01$), but not to leader identity, LPC, nor in any interactions. The greater the situational favorability, the greater the SEU. Negative Utility for failure (U_f) was also found to be significantly related to the situation although much less so than the previously mentioned variables ($F = 6.01$; $df = 3/201$; $p < .01$). Situations low in favorability were found to have a less negative U_f than highly favorable situations. The final dependent variable analyzed was the positive Utility for success (U_s). For this variable the general pattern of results was somewhat broken. Positive Utility for Success was significantly related to the situations ($F = 7.61$; $df = 3/201$; $p < .01$). Favorable situation had a higher U_s than unfavorable situation. However, LPC also was found to be related to this variable as a main effect ($F = 4.88$; $df = 1/67$; $p < .05$). High LPC subjects had lower U_s for the situations than did low LPC subjects. Compounding this result was an interaction between the identity of the leader and the subject's LPC ($F = 4.49$; $df = 1/67$; $p < .05$). Therefore the main effect of LPC upon U_s was modified such that the differences between high and low LPC subjects was only observed when the subjects estimate the U_s for an anonymous leader and not when they reported their own U_s .

Discussion

It was the purpose of this study to test, within an experimental design, the impact of Fiedler's situational favorability upon perceived uncertainty and risk. Both perceived uncertainty and risk were related to situational favorability as hypothesized. Highly favorable situations were characterized by certainty and little risk while unfavorable situations were uncertain and risky.

These results when taken with the Nebeker (1974) field studies provide a sound basis to interpret situational favorability as a perceived uncertainty dimension.

The interpretation of situational favorability as perceived uncertainty has a number of advantages over Fiedler's present control or influence interpretation. Some of these advantages are presented below.

TABLE 2

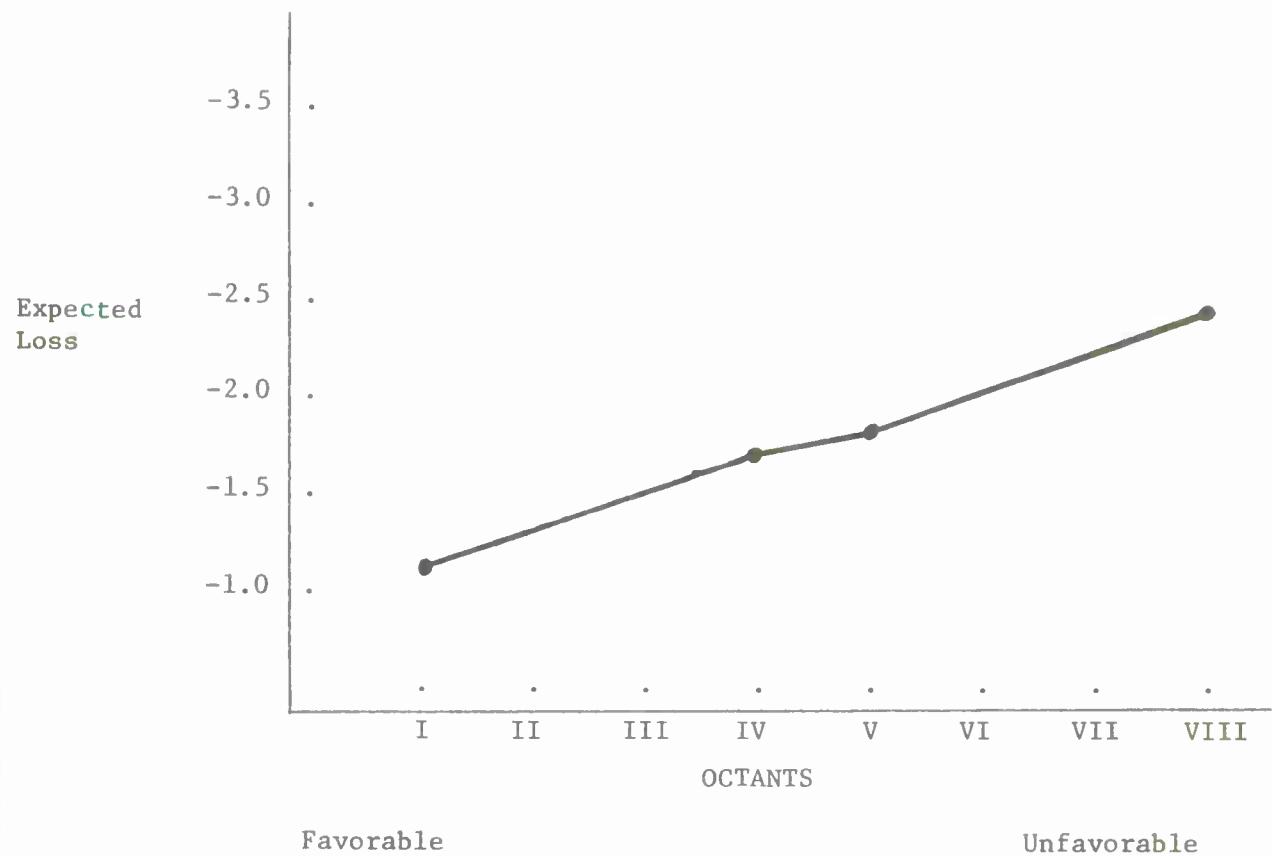
Analysis of Variance of
Expected Loss

SOURCE	df	MS	F
Between Subjects			
Identity of Leader (A)	1	3.964	.989
LPC (B)	1	.893	.223
AXB	1	.925	.231
Error Between	67	4.00	
Within Subjects			
Situation (C)	3	17.371	20.388 *
BXC	3	.500	.587
CXA	3	.269	.316
AXBXC	3	.249	.292
Error Within	201	.852	

* $p < .001$

Figure 2

Relationship Between Expected Loss
and Situational Favorability



1) Because the concept of uncertainty is prevalent in contingency approaches to organizations there is the possibility of integrating Fiedler's work with these other approaches into a comprehensive organizational structure-leadership system. Such a system would have obvious theoretical advantages over the present collection of loosely associated approaches. In addition the practical implications of a comprehensive organization structure-leadership system imply that the selection of organization designs and leaders should not be made independently. It is reasonable to expect that leadership style must be compatible with an organization's structure or vice versa in order to maximize performance.

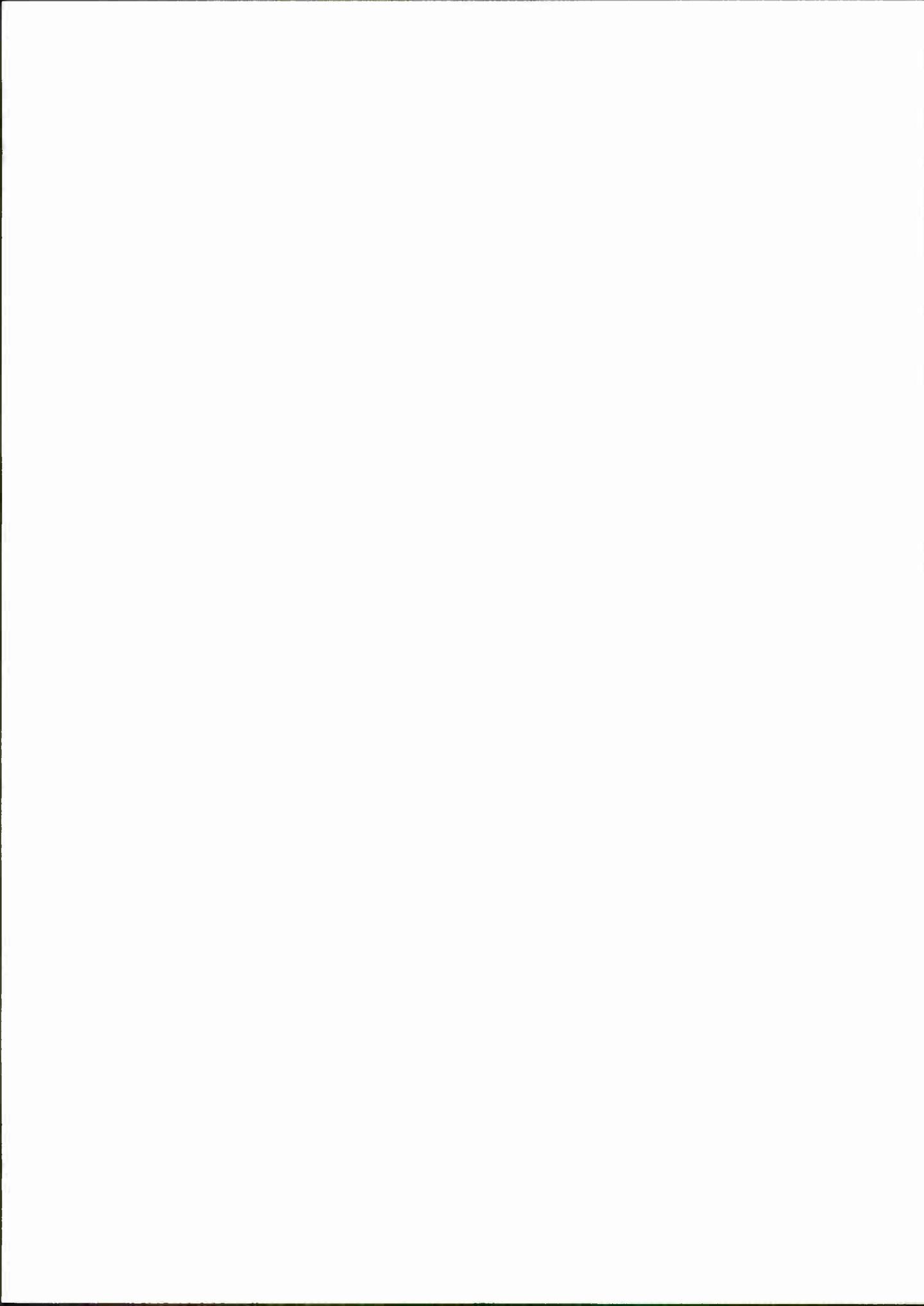
2) Interpreting situational favorability as an uncertainty dimension logically associates Fiedler's work with work done in decision theory and information processing. The data suggest that our understanding of leadership may be increased significantly by consideration of leader decision behavior. This view is shared by Vroom and Yetton (1973) and Nebeker and Mitchell (1974). Perhaps such an orientation can help us better understand what factors are most important in influencing leadership styles and why some leadership styles are effective in some situations and not in others. While neither of these issues is new, using decision theory as a tool to understand them is new. Because the data presented here suggests that high and low LPC individuals do not see the situations differently, and since performance differences must be explained by differences in behavior, the way leaders make decisions and process information may help us explain the differences in their behavior.

3) Finally, the apparent similarity between the contingencies between the situation and both organization structure and leadership style suggests that important attributes associated with an organization's formal structure also may be important attributes of leader behavior. For example, if an important attribute of a formal organization's structure is its emphasis upon vertical rather than horizontal communications, then it also may be true that this emphasis is an important aspect of leader behavior. It would follow then that our assessment of leadership behavior should be more closely resemble measures of organization structure variables and vice versa.

While this study supports the interpretation of situation favorability as an uncertainty dimension there are a number of questions that have not been addressed. First, the definitions of uncertainty in this study and that in Nebeker (1974) are not identical. In the latter (a field study) for instance, uncertainty was measured by the uncertainty associated with alternative behavior selection while this research measured the uncertainty associated with task success. Additional research is needed to clarify the distinction between these two measures. Second, the definition of certainty employed here implies that a probability of .80 reflects more certainty about task success than a probability of .10. A reasonable alternative definition of uncertainty would be that uncertainty equals the absolute value of the difference between P and .50. The closer P is to .50 the greater the uncertainty. From purely a mathematical point of view this definition makes a good deal of sense. Empirical support for

this definition is provided in Figure 1, which indicates that P for Octant VIII (the situation with the greatest uncertainty) in fact has a mean P of .50. Research is needed to examine if in situations where the mean P goes below .50, the perceived certainty begins to increase again. Third and finally, the relationship between the Octants and uncertainty and risk appears to be linear. However, since only four sample situations were used the linearity of the relationship has not been unequivocally established.

In summary, the results presented in this study provide support for a perceived uncertainty interpretation of Fiedler's situational favorability dimension. The implications of these findings for Fiedler's theory and other contingency theories were provided as well as some suggestions for future research.



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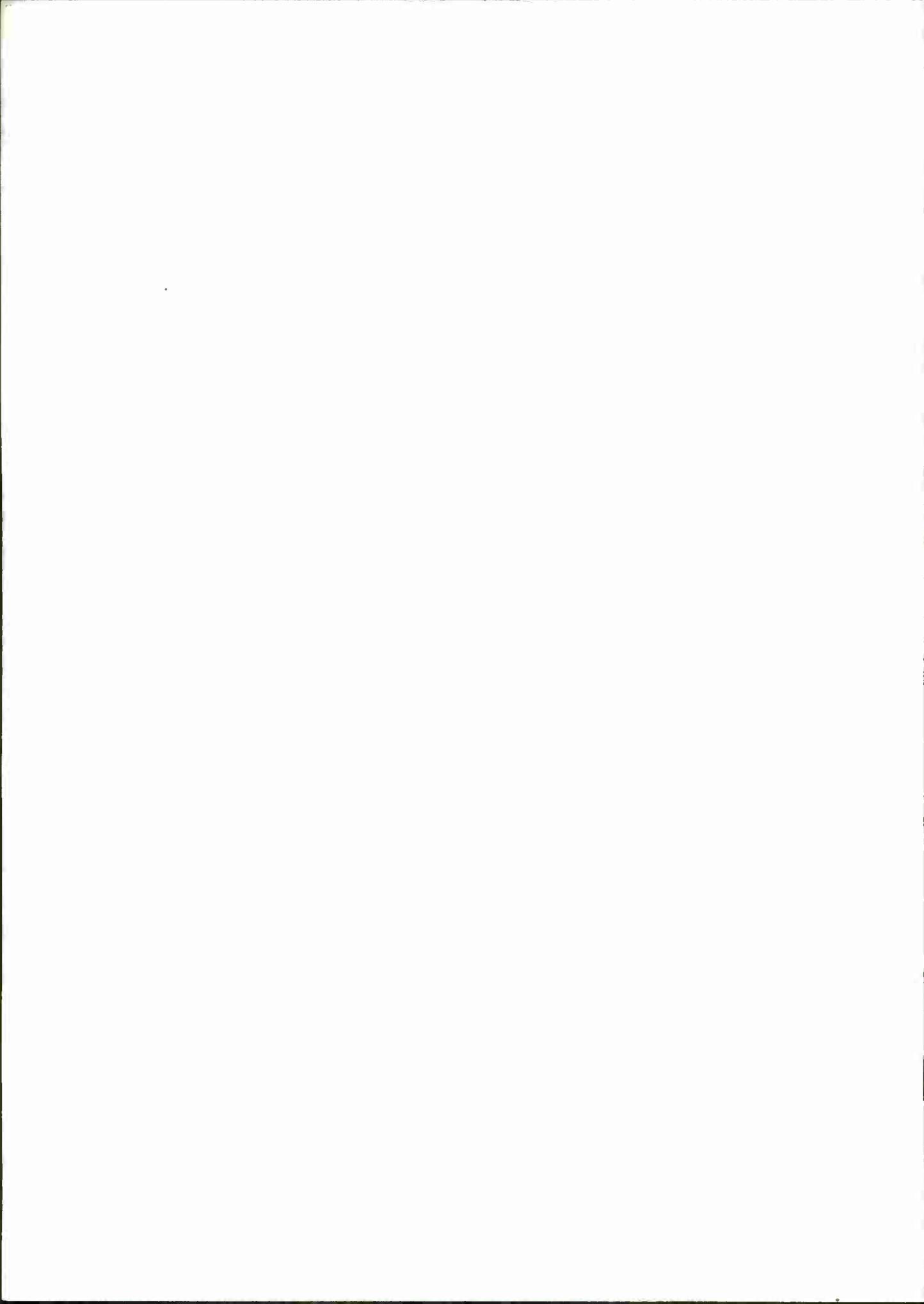
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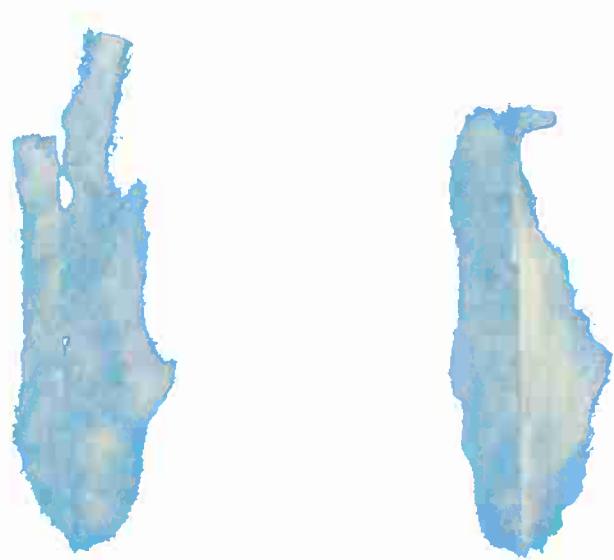
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Air Force Human Resources Laboratory (AFSC), Occupational Research Division,
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Air Force Human Resources Laboratory (AFSC), Personnel Research Division,
 Lackland AFB, Texas
Air Force Human Resources Laboratory, Brooks AFB, Texas
Air Force Military Personnel Center, Chief Modeling, Research & Evaluation
 Division, Randolph AFB, Texas
Civil Service Commission, Washington
Center for Naval Analyses
Office of Civilian Manpower Management
National Research Council
National Science Foundation
Science and Technology Division, Library of Congress
Defense Documentation Center (Attn: DDC-TC) [12]





The image shows a dense, abstract pattern of blue rectangular blocks on a white background. The blocks are arranged in a roughly triangular shape, with many overlapping and some pointing downwards. The pattern is composed of a repeating blue and white block motif, creating a sense of depth and complexity. The blue blocks are outlined in white, and the white blocks are outlined in blue. The overall effect is reminiscent of a network or a cloud of data points.